

BS EN 14399

HIGH STRENGTH STRUCTURAL BOLTING FOR PRE LOAD

Direct comparison as an alternative to ASTM HSFG



Bolts ASTM A325M Type 1, ASTM A490M Type 1 or 2

BS EN 14399-3:2005 Grade 8.8 and 10.9

Chemical composition

ASTM A325M Type 1 are medium carbon steel quenched

ASTM A325M (Heat analysis):

C: Carbon (0.30-0.52), Mn: Manganese (min 0.60),

P: Phosphorus (max 0.04), S: Sulfur (max 0.05), Si: Silicon (0.15-0.30)

Ref to BS EN 14399-3 Grade 8.8

ASTM A490M Type 1 are alloy steel, Type 2 as low-carbon

Type 1 as per F568: C (0.25-0.55); P (max 0.040); S (max 0.045); tempered in 425C

Type 2 as per F568: C (0.15-0.40); P (max 0.048); S (max 0.058); Mn (min 0.74); B (min 0.0005);

tempered in 340C

Ref to BS EN 14399-3 Grade 10.9

Andrews Fasteners Limited can offer:

BS EN 14399-3 carbon steel quenched and tempered (tempering temperature 425 degree C)

BS EN 14399-3 / EN ISO 898-1

8.8/10.9: C (0.25-0.55); P (max 0.025); S (max 0.025); B: Boron (0.003)

Mechanical Properties

Hardness

ASTM A325M Type 1

M12-M24: 25-34 HRC

M25-M36: 19-30 HRC

ASTM A490M

Hardness: 33-39 HRC

BS EN 14399-3 / EN ISO 898-1

Class 8.8 M16 = 22-32 HRC; above M16 = 23-34 HRC (**typical grade**)

Class 10.9 = 32-39 HRC (**higher grade**)



Tensile strength requirements

ASTM A325M Type 1 - M12-M36

Tensile strength 830 MPa; Yield Strength: 660 MPa

Elongation: 14% min; Reduction Area 35%

ASTM A490M

Proof Load: 830 MPa; Tensile: 1040 MPa; Yield: 940 MPa; Elongation 9%; Reduction area: 35%

BS EN 14399-3 / EN ISO 898-1

Tensile strength **(8.8)** 830 MPa; **(10.9)** 1040 MPa

Yield Strength: **(8.8)** 660MPa; **(10.9)** 940 MPa

Elongation: **(8.8)** 12%; **(10.9)** 9%

Reduction Area: **(8.8)** 52%; **(10.9)** 48%

Proof Load: **(8.8)** M16: 580 MPa; over M16: 600MPa; **(10.9)** 830 MPa

Dimensions

ASTM A325M / ASTM A490M to ASME B18.2.3.7M

As per BS EN 14399-3

Test methods

ASTM A325M / ASTM A490M: Tensile, Proof Load, Hardness

BS EN 14399-3 / EN ISO 898-1: Wedge, Proof Load, Hardness

and Assembly test as per BS EN 14399-2



Bolts are covered by 3.1 Test Certificate and Certificate of Conformity.



Finish: Self colour, Galvanised (40um min) as a standard, or on special requirements Zinc (7um min)

We refer to Galvanised product (Hot-dip) as this type of coating gives longer corrosion resistant protection comparing to Zinc plating.

Lubrication and Direct Tension Indicator washers required during assembly to archive correct tightening method (booklet attached)

Nuts ASTM A563M

BS EN 14399-3:2005 Grade 8 and 10



Chemical composition

ASTM A563M 8S and 10S

8S: C (max 0.55); P (max 0.04); S (max 0.15)

10S: C (max 0.55); Mn (min 0.30); P (max 0.04); S (max 0.05)



Andrews Fasteners Limited can offer:

BE EN 14399-2 / EN ISO 898-2

Grade 8: C (max 0.58); Mn (min 0.25); P (max 0.048); S (max 0.058)

Grade 10: C (max 0.58); Mn (min 0.30); P (max 0.048); S (max 0.058)

Mechanical Properties

Hardness

ASTM A563M 8S and 10S

8S: max 38 HRC

10S: 26-38 HRC

BS EN 14399-3 / EN ISO 898-2

Class 8.8 M16 = max 30 HRC; above M16 = max 36 HRC (**typical grade**)

Class 10.9 = 26-36 HRC (**higher grade**)

Strength requirements

ASTM A563M

Proof load: **A563M page 6**

BS EN 14399-3 / EN ISO 898-2

Proof Load: **ISO 898-2**

Dimensions

ASTM A563M to ASME B18.2.4.1M / B18.2.4.6M

As per BS EN 14399-3

Test methods

ASTM A563M: Proof Load, Hardness

BS EN 14399-3 / EN ISO 898-2 Proof Load, Hardness

Nuts are covered by 3.1 Test Certificate and Certificate of Conformity.

Washers ASTM F436M

BS EN 14399-6:2005

BS EN 14399-9:2005

**Andrews Fasteners Limited can offer Plain Chamfer washer (14399-6)
or Bolt/Nut face washer (14399-9)**

Mechanical Properties

ASTM F436M

Hardness: 38 – 45 HRC

When Hot-Dip galvanised: 26 – 45 HRC

BS EN 14399-6:2005

Hardness: 300 – 370 HV (eq. 30-38 HRC)

BS EN 14399-9:2005

Hardness: 372 HV30 – 448 HV30 (38 HRC – 45 HRC)

Dimensions

ASTM F436M as per attached page 3

As per BS EN 14399-3

